

IN THE CLAIMS:

On page 15, line 1, please cancel "Patent Claims" and substitute:

--WE CLAIM AS OUR INVENTION:-- therefor.

Cancel claims 1-12.

5 1-12 (Cancelled)

Add the following new claims:

13. (New) A magnetic resonance imaging apparatus comprising:

10 a static magnetic field source having two opposite faces connected by
 a magnetic return structure, said opposite faces facing each
 other and being separated by a space adapted to receive an
 examination subject therein;

15 first and second assemblies respectively mounted at said opposite
 faces, said first and second assemblies each being comprised of
 a plurality of components with the components in said first
 assembly being disposed mirror symmetrically, relative to a
 plane proceeding through said space, with respect to the
 components in the second assembly;

20 said components in each of said first and second assemblies
 comprising, in a sequence from one of said opposite faces
 toward said plane, a pole plate, a pole piece, gradient coils
 having an annular exterior, an RF transmission coil, a first
 shimming ring disposed at the annular exterior of said gradient
 coils, and a second shimming ring disposed at said annular
25 exterior of said gradient coils adjacent to said first shimming
 ring; and

 said second shimming ring in each of said first and second assemblies
 being mounted to allow adjustment of a distance of said second
 shimming ring from the first shimming ring in that assembly.

14. (New) A magnetic resonance imaging apparatus as claimed in claim 13 wherein, in each of said first and second assemblies, said RF transmitting coil has a face facing said plane, and said second shimming ring has a face facing said plane, with said face of said second shimming ring being no closer to said plane than said face of said RF transmitting coil.

15. (New) A magnetic resonance imaging apparatus as claimed in claim 13 wherein said space has a center point and wherein said static magnetic field source, at each of said opposite faces, comprises a plurality of groups of permanently magnetic columns respectively having different magnetic energy levels, said columns being disposed substantially symmetrically relative to an axis proceeding through said center point and a centered one of said plurality of magnetic columns in each of said first and second assemblies, with the respective magnetic energy levels of said centered ones of said plurality of magnetic columns respectively in said first and second assemblies being equal.

16. (New) A magnetic resonance imaging apparatus as claimed in claim 15 wherein, in each of said first and second assemblies, the respective, different magnetic energy levels are axially symmetric with respect to said axis, and wherein said plurality of permanently magnetic columns in each of said first and second assemblies includes a magnetic column formed as an annular ring centered relative to said axis, with the respective magnetic energy levels of said magnetic column formed as an annular ring in the respective first and second assemblies are equal.

17. (New) A magnetic resonance imaging apparatus as claimed in claim 16 wherein, in each of said first and second assemblies, magnetic columns in said plurality of magnetic columns that are disposed farther from said axis have a higher magnetic energy level than magnetic columns in said plurality of columns disposed closer to said axis.

18. (New) A magnetic resonance imaging apparatus as claimed in claim 15 wherein, in each of said first and second assemblies, said plurality of permanently magnetic columns is three, each of said permanently magnetic columns being annular and producing an external annular area having a

magnetic energy level N3, a middle annular area having a magnetic energy level N2, and an inner annular area having a magnetic energy level N1, with $N3 > N2 > N1$.

19. (New) A magnetic resonance imaging apparatus as claimed in
5 claim 15 comprising, in each of said first and second assemblies, a plurality of
magnetic bolts, selected from the group consisting of magnetically conductive
bolts and permanently magnetic bolts, respectively disposed substantially
parallel to, and symmetrically with respect to, said axis in at least one of said
pole plate, one or more of said permanently magnetic columns, said first
10 shimming ring or said second shimming ring, to shim the static magnetic field
generated by said static magnetic field source.

20. (New) A magnetic resonance imaging apparatus as claimed in
claim 13 comprising, in each of said first and second assemblies, a plurality of
magnetic bolts, selected from the group consisting of magnetically conductive
15 bolts and permanently magnetic bolts, disposed symmetrically at an exterior
edge of at least one of said static magnetic field source, said pole plate, said
first shimming ring, or said second shimming ring, to shim the static magnetic
field generated by said static magnetic field source.

21. (New) A magnetic resonance imaging apparatus comprising:
20 a static magnetic field source having two opposite faces connected by
a magnetic return structure, said opposite faces facing each
other and being separated by a space adapted to receive an
examination subject therein, said space having a center point;
first and second assemblies respectively mounted at said opposite
25 faces, said first and second assemblies each being comprised of
a plurality of components with the components in said first
assembly being disposed mirror symmetrically, relative to a
plane proceeding through said space, with respect to the
components in the second assembly; and
30 said space has a center point, said static magnetic field source, at each
of said opposite faces, comprises a plurality of groups of
permanently magnetic columns respectively having different

5 magnetic energy levels, said columns being disposed substantially symmetrically relative to an axis proceeding through said center point and a centered one of said plurality of magnetic columns in each of said first and second assemblies, with the respective magnetic energy levels of said centered ones of said plurality of magnetic columns respectively in said first and second assemblies being equal.

10 22. (New) A magnetic resonance imaging apparatus as claimed in claim 21 wherein, in each of said first and second assemblies, the respective, different magnetic energy levels are axially symmetric with respect to said axis, and wherein said plurality of permanently magnetic columns in each of said first and second assemblies includes a magnetic column formed as an annular ring centered relative to said axis, with the respective magnetic energy levels of said magnetic column formed as an annular ring in the
15 respective first and second assemblies are equal.

20 23. (New) A magnetic resonance imaging apparatus as claimed in claim 22 wherein, in each of said first and second assemblies, magnetic columns in said plurality of magnetic columns that are disposed farther from said axis have a higher magnetic energy level than magnetic columns in said plurality of columns disposed closer to said axis.

25 24. (New) A magnetic resonance imaging apparatus as claimed in claim 22 wherein, in each of said first and second assemblies, said plurality of permanently magnetic columns is three, each of said permanently magnetic columns being annular and producing an external annular area having a magnetic energy level N3, a middle annular area having a magnetic energy level N2, and an inner annular area having a magnetic energy level N1, with $N3 > N2 > N1$.

30 25. (New) A magnetic resonance imaging apparatus as claimed in claim 21 comprising, in each of said plurality of permanently magnetic columns at the respective opposite faces of said static magnetic field source, a plurality of magnetic bolts, selected from the group consisting of magnetically conducting bolts and permanently magnetic bolts, disposed

symmetrically relative to said axis and proceeding substantially parallel to said axis, to shim the static magnetic field generated by the static magnetic field source.

26. (New) A method for shimming a static magnetic field in a
5 magnetic resonance imaging apparatus, said apparatus comprising a static magnetic field source having two opposite faces connected by a magnetic return structure, said opposite faces facing each other and being separated by a space adapted to receive an examination subject therein, first and second assemblies respectively mounted at said opposite faces, said first and second
10 assemblies each being comprised of a plurality of components with the components in said first assembly being disposed mirror symmetrically, relative to a plane proceeding through said space, with respect to the components in the second assembly; said method comprising the steps of:

in each of said first and second assemblies, including in the mirror-
15 symmetric components thereof a first shimming ring, and a second shimming ring disposed adjacent to said first shimming ring; and

adjustably mounting said second shimming ring relative to said first
shimming ring and selectively adjusting a distance between said
20 second shimming ring and said first shimming ring to shim said static magnetic field.

27. (New) A method as claimed in claim 26 comprising the additional step, for shimming said static magnetic field of:

in each of said first and second assemblies, inserting a symmetrical
25 arrangement of magnetic bolts, selected from the group consisting of magnetically conductive bolts and permanently magnetic bolts.

28. (New) A method for shimming a static magnetic field in a
magnetic resonance imaging apparatus, said apparatus comprising a static
30 magnetic field source having two opposite faces connected by a magnetic return structure, said opposite faces facing each other and being separated by a space adapted to receive an examination subject therein, said space having

a center point, first and second assemblies respectively mounted at said opposite faces, said first and second assemblies each being comprised of a plurality of components with the components in said first assembly being disposed mirror symmetrically, relative to a plane proceeding through said space, with respect to the components in the second assembly; said method comprising the steps of:

in said static magnetic field source, at each of said two opposite faces, providing a permanently magnetic arrangement to generate said static magnetic field; and

dividing each of said permanently magnetic arrangements into a plurality of permanently magnetic columns respectively having different magnetic energy levels, and disposing the plurality of permanently magnetic columns at each of said opposite faces symmetrically relative to an axis proceeding through said center point of said space and oriented perpendicularly to said plane, and making the magnetic energy levels equal for respective permanently magnetic columns in each plurality of permanently magnetic columns through which said axis proceeds.

29. (New) A method as claimed in claim 28 comprising:

in each plurality of permanently magnetic columns, making the respective magnetic energy levels of columns farther from said axis higher than the respective magnetic energy levels of columns closer to said axis.

30. (New) A method as claimed in claim 26 comprising the additional step, for shimming said static magnetic field of:

in each of said first and second assemblies, inserting a symmetrical arrangement of magnetic bolts, selected from the group consisting of magnetically conductive bolts and permanently magnetic bolts.